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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/800,493 | 03/08/2001 | Hiroshi Moriya | 500.3930X00 | 2194 |

20457 7590 11/20/2002

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EXAMINER

QUINTO, KEVIN V

| | |
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| ART UNIT | PAPER NUMBER |
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2826

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,493

Applicant(s)

MORIYA ET AL.

Examiner

Kevin Quinto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-13 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1-6, 14, 15 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-6, 14, and 15 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 1-6, 14, and 17 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an oxide film which is in contact with both the first and second capacitor electrodes, does not reasonably provide enablement for an insulating film containing silicon as a main constituting element which is in contact with both the first and second capacitor electrodes. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Claims 1-5, 14, and 17 contain the phrase, "an insulating film containing silicon as a main constituting element and formed in contact with the first capacitor electrode and second capacitor electrode." Regarding claims 1-6 (claim 6 is dependent from any one of claims 1 to 5), 14, and 17, figure 1 (the elected species) does not enable any insulating film containing silicon as a main constituting element which is in contact with *both* the first and second capacitor electrodes.

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4. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an insulating film containing silicon as a main constituting element being formed for insulating the second capacitor electrode, does not reasonably provide enablement for an insulating film containing silicon as a main constituting element being formed for insulating the first capacitor electrode. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Figure 1 (the elected species) does not enable an insulating film containing silicon as a main constituting element which insulates both the first and second capacitor electrodes since the film only comes into contact with the second capacitor electrode.

5. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an electroconductive film, does not reasonably provide enablement for an electroconductive film between the first capacitor electrode or the second capacitor electrode and the insulating film. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Figure 1 (the elected species) does not enable an electroconductive film between the first capacitor electrode or the second capacitor electrode and the insulating film.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-6, 14 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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8. Claims 1-5, 14, and 17 contain the phrase “an insulating film containing silicon as a main constituting element and formed in contact with the first capacitor electrode and second capacitor electrode.” Since claim 6 is dependent from any one of claims 1 to 5, this rejection is applied to claim 6 as well. As discussed above, with regard to the rejection of claims 1-6, 14, and 17 under the first paragraph of 35 U.S.C. 112, the phrase “an insulating film containing silicon as a main constituting element and formed in contact with the first capacitor electrode and second capacitor electrode” is not enabled. Therefore the examiner finds this phrase to be indefinite. The examiner believes that the intent of the applicant was to describe a structure with an insulating film containing silicon as a main constituting element which is formed in contact with the second capacitor electrode. The examiner is not certain if this was the intent of the applicant but has interpreted the claims in this manner.

9. Claim 15 contains the phrase “an insulating film containing silicon as a main constituting element being formed for insulating the first capacitor electrode and the second capacitor electrode.” As discussed above, with regard to the rejection of claim 15 under the first paragraph of 35 U.S.C. 112, the phrase “an insulating film containing silicon as a main constituting element being formed for insulating the first capacitor electrode and the second capacitor electrode” is not enabled. Therefore the examiner finds this phrase to be indefinite. The examiner believes that the intent of the applicant was to describe a structure with an insulating film containing silicon as a main constituting element insulates the second capacitor electrode. The examiner is not certain if this was the intent of the applicant but has interpreted the claims in this manner.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in–

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

11. Claims 1-3 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Horikawa et al. (USPN 6,015,989).

12. So far as understood in claims 1-3, Horikawa et al. (USPN 6,015,989, hereinafter referred to as the “Horikawa” reference) discloses a similar device. Figure 12 of Horikawa discloses a semiconductor capacitor with a first capacitor electrode (130) with ruthenium as the main element and titanium as the additional element (column 10, lines 13-15). There is an oxide film (115) in contact with the first and second capacitor electrodes (130, 116). Horikawa has a silicon dioxide insulating film (117) in contact with the second capacitor electrode. The examiner believes that this meets the limitation, “an insulating film containing silicon as a main constituting element.”

13. So far as understood in claim 14, the process to fabricate the device of Horikawa meets this claim. Claim 14 discloses a process to form a device where both of the capacitor electrodes are in contact with an oxide capacitor dielectric film while an insulating film with silicon as its

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main constituting element is in contact with the second capacitor electrode. At least one of the capacitor electrodes has ruthenium as the main constituting material and an additional material of titanium. Claim 14 claims the fabrication process for the device of claim 1. As stated above, the device of Horikawa meets claim 1, and thereby meets the fabrication process limitation of claim 14.

Allowable Subject Matter

14. Claim 16 is allowed.

15. The following is a statement of reasons for the indication of allowable subject matter: the examiner is unaware of any semiconductor device with a capacitor electrode using rhodium, ruthenium, iridium, osmium, or platinum and having an additional metal of either palladium, nickel, cobalt, or titanium in a concentration over 15 atom %.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (703) 306-5688. The examiner can normally be reached on M-F 8AM-5PM.

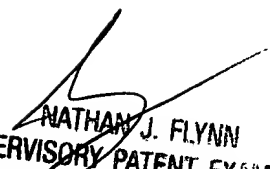
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

KVQ

November 18, 2002


NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800